

ABSTRACT OF THE DISCLOSURE

5 A system and method for focusing electromagnetic energy on a moving target. Generally, the inventive system sends a pilot beam to a target and analyzes a return wavefront to ascertain data with respect to any distortions and other phase and/or amplitude information in the wavefront. This information is then used to pre-distort an output beam by so that it is focused on the target by the intervening distortions. In an
10 illustrative embodiment, the pilot beam is provided by a beacon laser mounted off-axis with respect to the output beam. The reflected wavefront is received through a gimbaled telescope. Energy received by the telescope is detected and processed to ascertain wavefront aberrations therein. This data is used to predistort a deformable mirror to create an output beam which is the phase conjugate of the received
15 wavefront. In a first alternative embodiment, a nonlinear optical phase-conjugate mirror is employed to generate the required wavefront-reversed replica of the received wavefront. The system further includes an arrangement for modulating the output beam to confuse the target. In a second alternative embodiment, the system is adapted to examine atmospheric distortions of starlight to predistort the output beam. The
20 alternative embodiment offers a faster response time and a lower susceptibility to detection.